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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,510	04/01/2004	Evelyn N. Drake	2003UR021	8615

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EXAMINER	
HUGHES, SCOTT A	

ART UNIT	PAPER NUMBER
3663	

MAIL DATE	DELIVERY MODE
04/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/816,510	DRAKE ET AL.	
	Examiner	Art Unit	
	SCOTT A. HUGHES	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *52-86* is/are pending in the application.

4a) Of the above claim(s) *53,62,71,80 and 84* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *52,54-61,63-70,72-79,81-83,85 and 86* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 1/18/2008 have been fully considered but they are not persuasive.

Applicant argues that it is unreasonable for a person in the marine seismic surveying field to look for ideas in the field of open heart surgery. This argument is not persuasive because the claim limitations deal with bubble diffusers, bubbles and properties of bubbles in liquids. Therefore, one of ordinary skill using bubbles in a marine environment would look to other environments where properties of bubble diffusers are used and bubbles are affected by different methods and chemicals.

Applicant argues that Cosentino does not teach a method for increasing rise time, but rather wants the bubbles to dissolve as quickly as possible. This argument is not persuasive because the Cosentino reference was not cited as teaching increased rise time. The reference was cited to teach that a device can be coated with chemicals which are allowed to set before use, and that these chemicals will still affect the bubbles in the area around the device. The Behrens and Bernd references were cited as teaching increasing rise time of air bubbles.

Applicant argues that the Bernd reference does not teach increasing rise time by preventing bubbles from coalescing. This argument is not persuasive because the Bernd reference teaches that the chemicals are used to control bubble size, and to keep the bubbles in the wake for as long as possible. Bernd teaches that adding chemicals causes preservation of the bubbles, and further teaches that the bubbles should be

small and that larger bubbles are readily broken, and that the film helps to prevent the bubbles from increasing in size and breaking (Column 4).

The Behrens reference teaches a desire to limit bubble coalescence, and the Bernd reference teaches that chemical surfactants can affect the properties of air bubbles, including keeping them smaller and preventing them from dissolving or breaking down. From these teachings, it would be obvious to use chemicals as taught by Bernd to prevent bubble coalescence and keep the bubbles in the water for as long as possible in Behrens.

Even though Behrens teaches that larger bubbles are preferred, he does disclose that small bubbles are desired and need to be kept for certain high frequencies. Further, even though Behrens has different sized bubbles, he discloses that he needs to keep these different sizes in order to attenuate all desired frequencies. Therefore, Behrens has an interest in preventing coalescence and keeping the bubbles separate as described in his specification. Behrens has specifically taught that bubble coalescence is a problem to be avoided (avoiding commingling).

With regard to claim 79, applicant argues that the Bernd reference does not teach that the chemical additive must be substantially water insoluble. Applicant argues that Bernd teaches that the chemical must be soluble in trace amounts, and therefore teaches away. This argument is not persuasive because applicant claims "substantially water insoluble." The chemicals in Bernd are disclosed to be soluble in at least trace amounts, which is not the same as totally soluble. Further, the chemicals form a film

which does not dissolve completely in the water, and therefore the chemicals are "substantially insoluble in water" as claimed.

With regard to claim 83, applicant argues that Bernd does not teach a 25% concentration because the container is the whole ocean. This argument is not persuasive because the Bernd reference teaches that the concentration (mass per unit volume of water) affects performance and can be used as a control. Although Bernd is using the entire ocean, the concentration is in the general vicinity of the water and bubble mix. From the disclosure by Bernd that concentration of the chemicals can be used to control the performance, it would be obvious that one would use a 25% concentration if that would give the desired performance.

Applicant's arguments are therefore not persuasive.

Applicant's amendments to claim 74 are sufficient to overcome the rejection under 35 USC 112.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 52, 54-61, 63-70, 72-79, 81-83, and 85-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens (5959938) in view of (Bernd) and Cosentino (5863501).

With regard to claims 52 and 61, Behrens discloses using air bubbles emitted from a diffuser in water for the purpose of suppressing noise in a marine seismic survey (abstract; Column 1, Line 60 to Column 2, Line 16; Columns 4-5). Behrens teaches that the bubbles should not commingle (coalesce) before reaching the surface. Behrens does not disclose that a chemical additive is used with the bubbles generated to block the acoustic waves. Bernd teaches that it is known in the art of blocking acoustic waves in a marine environment to use chemical additives having bubble coalescence retardation properties with a bubble diffuser in order to prevent breakdown and dispersal of a bubble, thereby keeping bubbles small enough that they rise slowly and stay in an area behind the ship for a long time (Column 2; Column 3, Line 18 to Column 6, Line 48). It would have been obvious to modify Behrens to include chemical additives as taught by Bernd in order to prevent breakdown and dispersal of the bubble curtain, thereby keeping bubbles small enough that they rise slowly and stay in an area behind the ship for a long time. Bernd discloses mixing the chemical additives in with the water at the time that bubbles are emitted. This requires keeping the chemical and nozzles to emit the chemicals onboard the ship with the rest of the equipment. Cosentino teaches that it is known to use chemical additives having bubble coalescence retardation properties with bubble diffusers (abstract; Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to Column 9, Line 30). Cosentino teaches that the

surfactant (chemical additives) can be coated onto the diffuser before use and then be allowed to dry and set (Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to Column 9, Line 30). Cosentino teaches applying the chemical additives to the diffuser by flushing the device with the chemical additive, then draining and allowing the chemical additive and diffuser to dry. It would have been obvious to modify Behrens and Bernd to include applying the chemical additive to the diffuser before use and allowing it to dry as taught by Cosentino in order to allow the surfactant to act on the bubbles emitted by the diffuser without having to supply the chemical additive directly into the liquid surrounding the diffuser. Although Cosentino teaches flushing the device with the chemical additive and not applying it with a brush or spraying it onto the diffuser's surface, using a brush or spraying the chemical would be obvious because it would allow for the diffuser to be coated with surfactant and allowed to dry before use. The chemicals added to the diffuser by brush, spray, or flushing would act in the same way once allowed to dry.

With regard to claims 54 –55 and 63-64, Cosentino teaches that the chemical additive is a polyoxyalkylene) block copolymer composed of EO and PO blocks having the claimed structures and being a pluronic (Column 8, Line 16 to Column 9, Line 30).

With regard to claims 56 and 65, Bernd teaches diluting the additive in a suitable solvent (Column 3, Line 65 to Column 6, Line 48). It would have been obvious to use a solvent to dilute the additive as taught by Bernd in the bubble curtain of Behrens in order to allow the chemical additives to form a film on the bubbles and to control the diffusion of the bubbles so that it stops at a suitable point.

With regard to claim 57 and 66, Cosentino teaches that the diffuser's surface is allowed to set after application of the chemical additive for at least five minutes before use (drying overnight) (Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to Column 9, Line 30).

With regard to claims 58 and 67, Behrens discloses that the diffuser is a performed hose made from a polymeric material (Column 2, Lines 55-65).

With regard to claims 59 and 68, Behrens discloses preconditioning the hose by soaking it in water (Columns 23, Lines 55-68). Behrens discloses that the hose expands in water and that the hose has apertures that allow it to produce bubbles while in water. Since it is soaked in the water and allowed to expand before use, it is preconditioned.

With regard to claims 60 and 69, Bernd discloses recoating the diffuser by adding more chemicals each time it is to be used (Columns 2-5). It would be obvious to recoat the diffuser in order to have enough chemical additives present to affect the bubbles emitted during subsequent uses.

With regard to claim 70, Behrens discloses using air bubbles emitted from a diffuser in water for the purpose of suppressing noise in a marine seismic survey (abstract; Column 1, Line 60 to Column 2, Line 16; Columns 4-5). Behrens teaches that the bubbles should not commingle (coalesce) before reaching the surface. Behrens does not disclose that a chemical additive is used with the bubbles generated to block the acoustic waves. Bernd teaches that it is known in the art of blocking acoustic waves in a marine environment to use chemical additives having bubble coalescence

retardation properties with a bubble diffuser in order to prevent breakdown and dispersal of a bubble, thereby keeping bubbles small enough that they rise slowly and stay in an area behind the ship for a long time; said chemical additive being either undiluted or dissolved in alcohol (Column 2; Column 3, Line 18 to Column 6, Line 48). It would have been obvious to modify Behrens to include chemical additives as taught by Bernd in order to prevent breakdown and dispersal of the bubble curtain, thereby keeping bubbles small enough that they rise slowly and stay in an area behind the ship for a long time. Bernd discloses mixing the chemical additives in with the water at the time that bubbles are emitted. This requires keeping the chemical and nozzles to emit the chemicals onboard the ship with the rest of the equipment. Cosentino teaches that it is known to use chemical additives having bubble coalescence retardation properties with bubble diffusers (abstract; Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to Column 9, Line 30). Cosentino teaches that the surfactant (chemical additives) can be coated onto the diffuser before use and then be allowed to dry and set (Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to Column 9, Line 30). Cosentino teaches applying the chemical additives to the diffuser by flushing the device with the chemical additive, then draining and allowing the chemical additive and diffuser to dry. It would have been obvious to modify Behrens and Bernd to include applying the chemical additive to the diffuser before use and allowing it to dry as taught by Cosentino in order to allow the surfactant to act on the bubbles emitted by the diffuser without having to supply the chemical additive directly into the liquid surrounding the diffuser. Although Cosentino teaches flushing the device with the chemical additive and not

applying it by dunking in a container the contents of which are the chemical additive, the process of flushing or dunking both achieve the same result of immersing the device in the chemical solvent and it would have been obvious to use dunking instead of flushing. The chemicals added to the diffuser by dunking or flushing would act in the same way once allowed to dry.

With regard to claims 72-73, Cosentino teaches that the chemical additive is a poly(oxyalkylene) block copolymer composed of EO and PO blocks having the claimed structures and being a pluronic (Column 8, Line 16 to Column 9, Line 30).

With regard to claims 74, Bernd teaches that the alcohol is ethanol (Column 3, Line 65 to Column 6, Line 48). It would have been obvious to use a solvent to dilute the additive as taught by Bernd in the bubble curtain of Behrens in order to allow the chemical additives to form a film on the bubbles and to control the diffusion of the bubbles so that it stops at a suitable point.

With regard to claim 75, Cosentino teaches that the diffuser's surface is allowed to set after application of the chemical additive for at least five minutes before use (drying overnight) (Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to Column 9, Line 30).

With regard to claim 76, Behrens discloses that the diffuser is a performed hose made from a polymeric material (Column 2, Lines 55-65).

With regard to claim 77, Behrens discloses preconditioning the hose by soaking it in water (Columns 23, Lines 55-68). Behrens discloses that the hose expands in water

and that the hose has apertures that allow it to produce bubbles while in water. Since it is soaked in the water and allowed to expand before use, it is preconditioned.

With regard to claim 78, Bernd discloses recoating the diffuser by adding more chemicals each time it is to be used (Columns 2-5). It would be obvious to recoat the diffuser in order to have enough chemical additives present to affect the bubbles emitted during subsequent uses.

With regard to claim 79, Behrens discloses using air bubbles emitted from a diffuser in water for the purpose of suppressing noise in a marine seismic survey (abstract; Column 1, Line 60 to Column 2, Line 16; Columns 4-5). Behrens teaches that the bubbles should not commingle (coalesce) before reaching the surface. Behrens does not disclose that a chemical additive is used with the bubbles generated to block the acoustic waves. Bernd teaches that it is known in the art of blocking acoustic waves in a marine environment to use substantially water-insoluble chemical additives having bubble coalescence retardation properties with a bubble diffuser in order to prevent breakdown and dispersal of a bubble, thereby keeping bubbles small enough that they rise slowly and stay in an area behind the ship for a long time; said chemical additive being either undiluted or dissolved in alcohol (Column 2; Column 3, Line 18 to Column 6, Line 48). It would have been obvious to modify Behrens to include chemical additives as taught by Bernd in order to prevent breakdown and dispersal of the bubble curtain, thereby keeping bubbles small enough that they rise slowly and stay in an area behind the ship for a long time. Bernd discloses mixing the chemical additives in with the water at the time that bubbles are emitted. This requires keeping the chemical and

nozzles to emit the chemicals onboard the ship with the rest of the equipment. Cosentino teaches that it is known to use chemical additives having bubble coalescence retardation properties with bubble diffusers (abstract; Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to Column 9, Line 30). Cosentino teaches that the surfactant (chemical additives) can be coated onto the diffuser before use and then be allowed to dry and set (Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to Column 9, Line 30). Cosentino teaches applying the chemical additives to the diffuser by flushing the device with the chemical additive, then draining and allowing the chemical additive and diffuser to dry. It would have been obvious to modify Behrens and Bernd to include applying the chemical additive to the diffuser before use and allowing it to dry as taught by Cosentino in order to allow the surfactant to act on the bubbles emitted by the diffuser without having to supply the chemical additive directly into the liquid surrounding the diffuser. Although Cosentino teaches flushing the device with the chemical additive and not applying it by dunking in a container the contents of which are the chemical additive, the process of flushing or dunking both achieve the same result of immersing the device in the chemical solvent and it would have been obvious to use dunking instead of flushing. The chemicals added to the diffuser by dunking or flushing would act in the same way once allowed to dry.

With regard to claims 81-82, Cosentino teaches that the chemical additive is a ploy(oxyalkylene) block copolymer composed of EO and PO blocks having the claimed structures and being a pluronic (Column 8, Line 16 to Column 9, Line 30).

With regard to claim 83, Behrens discloses using air bubbles emitted from a diffuser in water for the purpose of suppressing noise in a marine seismic survey (abstract; Column 1, Line 60 to Column 2, Line 16; Columns 4-5). Behrens teaches that the bubbles should not commingle (coalesce) before reaching the surface. Behrens does not disclose that a chemical additive is used with the bubbles generated to block the acoustic waves. Bernd teaches that it is known in the art of blocking acoustic waves in a marine environment to use substantially water-insoluble chemical additives having bubble coalescence retardation properties with a bubble diffuser in order to prevent breakdown and dispersal of a bubble, thereby keeping bubbles small enough that they rise slowly and stay in an area behind the ship for a long time; said chemical additive being either undiluted or dissolved in alcohol (Column 2; Column 3, Line 18 to Column 6, Line 48). It would have been obvious to modify Behrens to include chemical additives as taught by Bernd in order to prevent breakdown and dispersal of the bubble curtain, thereby keeping bubbles small enough that they rise slowly and stay in an area behind the ship for a long time. Bernd discloses mixing the chemical additives in with the water at the time that bubbles are emitted. This requires keeping the chemical and nozzles to emit the chemicals onboard the ship with the rest of the equipment. Cosentino teaches that it is known to use chemical additives having bubble coalescence retardation properties with bubble diffusers (abstract; Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to Column 9, Line 30). Cosentino teaches that the surfactant (chemical additives) can be coated onto the diffuser before use and then be allowed to dry and set (Column 4, Line 47 to Column 5, Line 26; Column 7, Line 14 to

Column 9, Line 30). Cosentino teaches applying the chemical additives to the diffuser by flushing the device with the chemical additive, then draining and allowing the chemical additive and diffuser to dry. It would have been obvious to modify Behrens and Bernd to include applying the chemical additive to the diffuser before use and allowing it to dry as taught by Cosentino in order to allow the surfactant to act on the bubbles emitted by the diffuser without having to supply the chemical additive directly into the liquid surrounding the diffuser. Although Cosentino teaches flushing the device with the chemical additive and not applying it by dunking in a container the contents of which are the chemical additive, the process of flushing or dunking both achieve the same result of immersing the device in the chemical solvent and it would have been obvious to use dunking instead of flushing. The chemicals added to the diffuser by dunking or flushing would act in the same way once allowed to dry. Cosentino teaches applying up to 10 wt. % of the additive in the specific examples, and therefore does not disclose using 25 wt. % as claimed. However, as taught by Bernd (Column 6), controlling the concentration of the chemical solution can control the properties of the bubbles. It would therefore be obvious to use 25 wt. % of the additive if a higher concentration of chemicals was required to achieve bubbles with certain properties.

With regard to claims 85-86, Cosentino teaches that the chemical additive is a ploy(oxyalkylene) block copolymer composed of EO and PO blocks having the claimed structures and being a pluronic (Column 8, Line 16 to Column 9, Line 30).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT A. HUGHES whose telephone number is (571)272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. A. H./
Examiner, Art Unit 3663

/Jack W. Keith/
Supervisory Patent Examiner, Art Unit 3663